



DEPARTMENT OF THE NAVY
NAVAL AIR SYSTEMS COMMAND
NAVAL AIR SYSTEMS COMMAND HEADQUARTERS
1421 JEFFERSON DAVIS HWY
ARLINGTON VA 22243 -5120

IN REPLY REFER TO

NAVAIRINST 5451.96
AIR-4.4
4 Apr 95

NAVAIR INSTRUCTION 5451.96

From: Commander, Naval Air Systems Command

Subj: MISSIONS, FUNCTIONS, AND TASKS OF THE NAVAL ENGINE AIRFOIL CENTER,
NAVAL AVIATION DEPOT, CHERRY POINT, NC

Ref: (a) Defense Depot Maintenance Council (DDMC), Joint Service Business
Plan of Feb '91
(b) Defense Depot Maintenance Council (DDMC), Corporate Business Plan
FY 91-95 of Sep '91
(c) Naval Air Systems Command AIR-433/214 ltr of 26 Jul '94
(d) FASOINST 4710.17A, Aviation Engine Airfoil Repair/Refurbishment
Program

1. Purpose. This instruction informs all Naval Aviation Activities of the Gas Turbine Engine Airfoil Technology Center and Naval Engine Airfoil Center (NEAC) at Naval Aviation Depot (NAVAVNDEPOT), Cherry Point, and provides procedures for managing refurbishable airfoils.

2. Scope. This directive applies to activities within the jurisdiction of Chief of Naval Operations (CNO); Commander, Naval Supply Systems Command (NAVSUP); Commander, Naval Air Systems Command (NAVAIR); Commandant of the Marine Corps (CMC); Commander, Naval Air Force; U.S. Atlantic Fleet (CNAL); Commander, Naval Air Force, Pacific Fleet (CNAP); Chief, Naval Air Training (CNATRA); and Commander, Naval Air Reserve Force (COMNAVAIRESFOR).

3. Background

a. In 1978, NEAC started a prototype program designed to recover Not Ready For Issue (NRFI) F402 engine airfoils that were previously considered to be scrap material. The F402 program proved to be cost effective. To expand the effort to other gas turbine engines and obtain similar cost savings for airfoils Navy-wide, NAVAIR designated NEAC, Cherry Point as the Navy Gas Turbine Engine Blade and Vane Technology Center.

b. Traditionally, the Navy has managed airfoils as 100 percent consumable line items of supply. However, with the establishment of NEAC, Cherry Point as the official airfoil repair facility, procedures to identify repair candidates, direct return of assets for repair, and consideration of asset recoverability in procurement decisions are required.



c. The Deputy Secretary of Defense directed the Services in 1990 to develop and implement short-range and long-range plans to create cost reductions for Department of Defense (DoD) depot maintenance operations. Commodity studies were undertaken, reference (a), and the "Gas Turbine Engine Blade and Vane Study" (Air Force lead) identified the following as a joint-service decision:

- (1) Consolidate all organic Type II blade and vane repairs at NEAC, Cherry Point.
- (2) Determine which Army blades and vanes may be subject to Type II repair and consider interservicing to NEAC, Cherry Point.
- (3) Designate NEAC, Cherry Point as repair design activity available for all DoD usage.

Reference (b) was endorsed by the Assistant Secretary of Defense, Production and Logistics (ASD(P&L)) on 7 February 1992. This instruction establishes responsibilities and authorities of the NEAC, Naval Air Systems Command Headquarters, and other NAVAIR activities in the performance of that mission.

4. Policy

a. Per reference (c), all Type II blade and vane repairs will be consolidated at NEAC. NEAC will coordinate both organic repairs and the contracting of Type II repairs for which it has not established repair capability.

b. NEAC is designated as a repair design activity available for all DoD usage.

5. Definitions. Terms used in this instruction are defined as follows:

a. Airfoil. Any blade, vane or segment used to compress or direct air flow through a gas turbine engine.

b. Blades. Airfoil components designed to propel air through the engine.

c. Vanes. Airfoil components designed to change the direction of air through the engine.

d. Blisks. A term for bladed disks, Integrally Bladed Rotors (IBR's), or similar airfoil components in which the blades and disks are manufactured from or bonded into a single piece of metal.

e. The Component Improvement Program (CIP), which is controlled and administered by NAVAIR (AIR-4.4), is designed to identify, test, and approve changes in material, design, or repair of turbine engine components to improve safety, reliability, or maintainability.

f. Cognizant Field Activities (CFA) provide engineering oversight and ownership of individual gas turbine engines and, as such, authorize repair processes on those engines.

g. The Blade/Vane Repair Work Group (BVRWG) consists of members from AIR-4.4 Deputy Assistant Program Management (DAPM) or designee, Assistant Program Management Logistics (APML), NEAC, Aviation Supply Office (ASO)/Inventory Control Point, and CFAs with the responsibility for reviewing repair candidates, evaluating proposed repair processes, and recommending repair approval to CFA.

h. The Blade/Vane Steering Committee (BVRSC) consists of members from AIR-4.4 (this member will chair the committee), AIR-3.1.5, NEAC, and ASO. This committee will have the responsibility of providing policy and direction for the BVRWG.

i. Type I Repair. A repair consisting of cleaning, blending nicks within limits, and painting in which no metallurgical change occurs.

j. Type II Repair. A repair involving metallurgical changes such as welding, brazing, heat treating, and diffusion of coatings in which properties of the airfoil (fatigue life, temperature resistance, etc.) may be altered.

6. Action

a. Naval Aviation Systems Propulsion and Power Engineering Department (AIR-4.4) will:

(1) be responsible for overall program direction, and provide administrative and technical oversight on naval gas turbine engine repairs;

(2) chair the BVRSC (AIR-4.4, AIR-3.1.5, NEAC, and ASO). The committee should meet as required, but no less than twice yearly;

(3) establish a BVRWG for each type/model engine. Each group will consist of the following permanent members: AIR-4.4 DAPM or designee (chairperson), APML, ASO, CFA, and NEAC;

(4) provide funding to support repair development, testing, and approval utilizing NEAC as the repair development source;

(5) provide development test and evaluation support when directed by the BVRWG;

(6) conduct engineering evaluations of cleaning, joining, and coating processes when identified in the Plan of Actions and Milestones (POA&M);

(7) define testing procedures to qualify repair processes and provide cost projection and testing services when applicable; and

(8) process changes to Source, Maintenance, and Recoverability Codes for repairable airfoils as required.

b. NEAC, NAVAVNDEPOT, Cherry Point, will:

(1) be responsible for technical direction. Provide engineering expertise in welding, brazing, coating, heat treating, cleaning, and other manufacturing processes for the purpose of evaluating airfoils for possible repair;

(2) maintain the Naval Center of Excellence (COE) for engine blade/vane repair as designated by the NAVAIR Lead Maintenance Technology Center (LMTTC) (AIR-3.6), assignment;

(3) provide member(s) to the BVRSC and BVRWG to develop POA&M and technical data for repair candidates;

(4) utilize BVRSC and BVRWG recommendations, develop repairs for selected airfoils including all manufacturing processes and repair cost data, and provide repair process document to BVRSC and BVRWG for repair approval;

(5) provide technical support to NAVAIR and NAVAVNDEPOT's to resolve airfoil problems on current and future naval gas turbine engines;

(6) provide airfoil production repair capability/capacity as vendor support to all DoD activities;

(7) maintain a current NEAC product repair list sorted by type/model/series (TMS), to include part number and stock number;

(8) develop and utilize a blade and vane repair algorithm (decision process) for the program; and

(9) coordinate with ASO to ensure availability of bit-and-piece part support.

c. NAVAVNDEPOTs will:

(1) provide members to the AIR-4.4 BVRWG;

(2) identify and verify testing requirements to BVRWG to provide the data needed to make acceptance/rejection decisions on the repair process;

(3) analyze repair process and test data in order to approve repair process per POA&M requirements; and

(4) identify training requirements necessary to maintain blade and vane handling proficiency.

d. NAVAIR Logistics Management Department, Propulsion Division (AIR-3.1.5) will:

- (1) provide member(s) to the BVRSC and BVRWG for airfoil components under CFA control;
- (2) support the LMTC for engine blade and vane repair; and
- (3) incorporate LMTC into each propulsion system TMS support program, where applicable. Solicit support at fleet meetings, where applicable.

e. ASO will:

- (1) provide members to the BVRSC and BVRWG;
- (2) update reference (d) annually;
- (3) develop new airfoil material procurement requirements to address airfoil repair processes;
- (4) ensure that Stratification/Budget efforts accurately reflect the new airfoil acquisition strategy;
- (5) process approved changes to Cognizance Code and Source, Maintenance, and Recoverability codes for repairable airfoils as required; and
- (6) provide bit-and-piece part support as required to support airfoil repair.

6. Review. The Propulsion and Power Engineering Department shall review annually the contents herein and provide recommendations for changes and deletions to the Commander.


J. A. LOCKARD

Distribution: FKA1A (established quantity); others 2 copies
SNDL: FKA1A (Deputy Commanders, Assistant Commanders, Comptroller, Command Special Assistants, Designated Program Managers, Directorate Directors, and Office and Division Directors); FKR

Copy to: (2 copies each unless otherwise indicated)
SNDL: C21 (1 copy); FKA1A (AIR-7.5 A/L (1 copy), AIR-7.2.5.4 (20 copies), AIR-7.2.5.2 (5 copies), AIR-4.4 (5 copies); FKM27 (NPPSO-NDW C/L)

Stocked: Commanding Officer, Navy Aviation Supply Office, Physical Distribution Division (Code 103), 5801 Tabor Avenue, Philadelphia, PA 19120-5099